

defining a tangent point to the radial line and wherein the non-intersecting fluid retaining groove is adapted to flow a fluid inwardly toward a center portion of the semiconductor polishing device.

33. The apparatus of claim 32, wherein the semiconductor polishing device is one of a polishing pad and a platen.

34. The apparatus of claim 33, wherein a depth of the non-intersecting fluid retaining groove changes along a length of the non-intersecting fluid retaining groove.

35. The substrate polishing pad of claim 14, wherein at least one of the one or more fluid retaining grooves has a first portion and a second portion having a same direction of curvature and defining a tangent point to a radial line extending from a center to the substrate polishing pad.

36. The substrate polishing pad of claim 14, wherein at least one of the one or more fluid retaining grooves has a first portion and a second portion having a same direction of curvature and defining a tangent point to a radial line extending from a center to the substrate polishing pad; and wherein at least one other of the one or more fluid retaining grooves extend from the center portion of the substrate polishing pad to an edge of the substrate polishing pad and wherein no point of the at least one other of the one or more fluid retaining grooves is tangent to the radial line.--

REMARKS

This is intended as a full and complete response to the Office Action dated March 15, 2002, having a shortened statutory period for response set to expire on June 15, 2002.

Claims 1-36 are pending in the application following entry of this response. Claims 1, 3-8 have been amended. Claims 32-36 have been added.

Claims 1, 4, 5, 6, 8, 9, 11, 14, 15, 16, 18, 19, 20, 26 and 27 stand rejected under 35 U.S.C. 102(a) as being anticipated by *Elliott et al.*, U.S. Patent No. 5,690,540

Page 7

(hereinafter *Elliott*). The Examiner states that *Elliott* discloses a semiconductor polishing device with one surface defining at least one non-intersecting fluid retaining groove, at least a portion of which is oriented at an angle relative to a radial line originating at its center, is adapted to flow a fluid inwardly toward a center portion of its surface, and is adapted to be used with a rotary polisher. The Applicants respectfully traverse the rejection.

At least some of the rejected pending claims recite two or more non-intersecting fluid retaining grooves. (See, e.g., claim 1.) Other claims recite a non-intersecting fluid retaining groove having a first portion and a second portion having a same direction of curvature and defining a tangent point to a radial line extending from a center of a semiconductor polishing device. (See, e.g., claim 4.) An embodiment of the latter claim recitation is shown in Figure 5. In one aspect, the latter embodiment provides a higher degree of control of slurry distribution. Such an embodiment is in contrast to *Elliott* in which slurry can only be transported to the center of a polishing pad. (See, column 3, line 6-8.)

Further, at least some of the rejected pending claims recite a plurality of non-intersecting grooves. (See, e.g., claim 14.) Where a plurality of grooves are disclosed by *Elliott*, such grooves are not non-intersecting. (See Figure 3.) Therefore, allowance of the claims is respectfully requested.

Claims 3 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Elliott*. The Examiner correctly states that *Elliott* does not disclose a groove having a varying slope. However, the Examiner states that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the pad of *Elliott* to change the depth of the groove to increase or decrease to flow rate, hence the quantity, of the slurry. The Applicants respectfully traverse the rejection.

Elliott provides definitive groove configuration limitations. In particular, *Elliott* discusses the effects of groove depth, width and pitch. (See, column 4, lines 20-31.) In the case of depth, the grooves disclosed in *Elliott* are substantially uniformly deep along their lengths. (See, Figure 2.) *Elliott* suggests that the depth of a groove may be selected according to a desired flow slurry rate. However, because the groove configuration of *Elliott* is limited to providing slurry to a center of a polishing pad, *Elliott*

does not contemplate varying a groove depth along its length. Therefore, *Elliott* does not teach, show or suggest a groove with a varying depth. For these reasons, a person skilled in the art would not be motivated by *Elliott* to use a groove with a varying depth. If the Examiner disagrees, the Applicants respectfully request that the Examiner provide supporting material for his position.

Claims 2, 12, 13, 23, 24, 28, 30 and 31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Elliott et al* in view of *Beardsley et al.*, U.S. Patent No. 6,299,515 (hereinafter *Beardsley*). For the reasons discussed above, the rejection is obviated based on *Elliott* alone. *Beardsley* is directed to a patterned platen for transporting slurry. Thus, *Elliott* is exclusively directed to grooves in a polishing surface of a pad and *Beardsley* is exclusively directed to grooves in a platen. Further, *Beardsley* delivers slurry from the platen through the pad and onto the polishing surface of the pad. In contrast, *Elliott* delivers slurry directly onto the polishing surface of the pad. As a result, the slurry dispenser of *Beardsley* is suited only for slurry delivery to a platen and the slurry dispenser of *Elliott* is suited only for slurry delivery to a pad. Therefore, a person skilled in the art would not be motivated to combine *Elliott* with *Beardsley* because any effort to do so would result in an inoperative device due to the incompatibility of slurry delivery devices. Therefore, the rejection is improper. M.P.E.P. §2143.01.

Claims 7, 10, 21, 22, 25 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Elliott et al* in view of *Beardsley et al.* and further in view of *Okamura et al.*, U.S. Patent '596 B1. For the reasons discussed above, the rejection is obviated based on *Elliott* and *Beardsley* alone or in combination. The Applicants note that *Okamura et al.*, U.S. Patent '596 B1 is not a reference of record. Applicants were provided with a copy of *Okamura et al.*, U.S. Patent '830 B1. Applicants respectfully request clarification regarding which reference is being relied on for the basis of the rejection.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the method or process of the present invention. Having addressed all issues set out in the office action, Applicants respectfully submit

that the claims are in condition for allowance and respectfully request that the claims be allowed.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

Respectfully submitted,



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